

# ANNUAL HIGHLIGHTS



# 2022

Cover image:

Bamboo and rattan have many applications in urban lifestyles. Illustrations by Jen Rao

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# International Bamboo and Rattan Organization

Established in 1997, the International Bamboo and Rattan Organization (INBAR) is an intergovernmental development organization that promotes environmentally sustainable development using bamboo and rattan. At the end of 2022, INBAR was made up of 49 Member States, which had grown to 50 by 1 March 2023. In addition to its Secretariat Headquarters in China, INBAR has five Regional Offices in Cameroon, Ecuador, Ethiopia, Ghana and India.

## 16 Member States in Asia-Pacific

Bangladesh, Bhutan, Cambodia, China, Fiji, India, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, Tonga and Viet Nam.

## 22 Member States in Africa

Benin, Burundi, Cameroon, the Central African Republic, Chad, the Congo, the Democratic Republic of the Congo, Eritrea, Ethiopia, Ghana, Kenya, Liberia, Madagascar, Malawi, Mozambique, Nigeria, Rwanda, Senegal, Sierra Leone, Tanzania, Togo and Uganda.

## 12 Member States in the Americas

Argentina, Brazil, Canada, Chile, Colombia, Cuba, Ecuador, Jamaica, Panama, Peru, Suriname and Venezuela.

# Acronyms and Abbreviations

ABARC	Africa Bamboo and Rattan Congress
AECID	Spanish Agency for International Development Cooperation
BARC	Second Global Bamboo and Rattan Congress
BRICS	Brazil, Russia, India, China and South Africa
CEMCA	Commonwealth Educational Media Centre for Asia
CIFTIS	China International Fair for Trade in Services
COVID-19	coronavirus disease 2019
COP	Conference of the Parties
FAO	Food and Agriculture Organization
GDI	Global Development Initiative
GiZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ICBR	International Centre for Bamboo and Rattan, China
IFAD	International Fund for Agricultural Development
INBAR	International Bamboo and Rattan Organization
ISO	International Organization for Standardization
ISO/TC 296	ISO Technical Committee 296
SIBGUADUA	International Bamboo and Guadua Symposium
SME	small and medium enterprises
UN	United Nations
UNCBD	UN Convention on Biological Diversity
UNCCD	UN Convention to Combat Desertification
UNEP	UN Environment Programme
UNESCO	UN Educational, Scientific, and Cultural Organization
UNFCCC	UN Framework Convention on Climate Change
UNFF	UN Forum on Forests
UNIDO	UN Industrial Development Organization
WCMC	World Conservation Monitoring Centre

# Table of Contents

- 1 Foreword from the Board Co-Chair and Acting Chair**
- 2 Foreword from the Director General**
- 3 Celebration of INBAR's 25<sup>th</sup> Anniversary and the Second Global Bamboo and Rattan Congress 2022**
- 7 Bamboo as a Substitute for Plastic Initiative**
- 9 Policy Shaping**
- 15 Representation and Advocacy**
- 23 Action Research and Country Support**
- 33 Knowledge Sharing and Learning**
- 37 Publications and Events**

## Foreword from the Board Co-Chair and Acting Chair



On behalf of the International Bamboo and Rattan Organization's (INBAR) Board of Trustees, I would like to thank you, the reader, for your support and interest over the years.

As the 25<sup>th</sup> anniversary of INBAR's founding, 2022 offered a unique perspective to look back on our accomplishments. Over the last two and a half decades, INBAR has grown from 9 to 49 Member States, becoming an organization truly global in scope. We have successfully elevated the international status of bamboo and rattan, becoming part of the United Nation's (UN) conventions on biodiversity, climate change and desertification, and also being granted formal Observer status to the UN General Assembly. Moreover, our trainings have reached over 150,000 beneficiaries, with projects, research, workshops and study visits in over 80 countries.

INBAR celebrated the milestone by hosting the Second Global Bamboo and Rattan Congress (BARC 2022) in Beijing under the theme "Bamboo and Rattan — Nature-based Solutions for Sustainable Development," gathering dignitaries from around the world to promote green economic development with bamboo and rattan as well as their important contribution to achieving the UN Sustainable Development Goals.

At the Congress, the Government of China and INBAR officially co-launched the Concept Note of the Bamboo as a Substitute for Plastic Initiative. This Initiative aims to harness bamboo to reduce plastic pollution and address climate change. It is set to play an important role in strategically reducing the flow of plastic waste into natural habitats by encouraging the mainstreaming of bamboo-based products and materials. The work builds on INBAR's track record of raising awareness at UN climate change conferences, international fora and fairs, and participating in the Intergovernmental Negotiation Committee to develop a legally binding instrument on plastic.

In 2022, our international outreach work persevered despite COVID-19 travel restrictions. We welcomed the Republic of Chad as our 49<sup>th</sup> Member State and 21<sup>st</sup> Member State in Africa. And, early in 2023, the Democratic Republic of the Congo became our 50<sup>th</sup> Member State in large part to our efforts in 2022. At the same time, INBAR continued to fly the flag of bamboo and rattan at events in the Host Country, raising awareness of the versatile forest resources. At the China International Fair for Trade in Services 2022 in Beijing, the INBAR pavilion showcased an array of bamboo products. INBAR also had a strong presence at international bamboo industry fairs and expos in Yibin, Meishan and Yong'an, where we promoted the work of the organization and championed the role of bamboo as a nature-based solution.

Your support over the years has been critical to us executing our sustainable mission. From INBAR, we wish you good tidings in the Year of the Rabbit!

**JIANG ZEHUI**

Co-Chair and Acting Chair of the INBAR Board of Trustees

## Foreword from the Director General



2022 was a sensational year for bamboo and rattan. Our organization's efforts paid off in dividends, reflected by our diverse range of major accomplishments.

In November, INBAR hosted the Celebration of INBAR's 25<sup>th</sup> Anniversary and the Second Global Bamboo and Rattan Congress in Beijing, bringing together national leaders, policymakers, experts, researchers and private sector leaders. The landmark event featured an Ambassadors' Dialogue, where country representatives explored how to mainstream bamboo-based materials; keynote presentations from experts in their fields; and 35 parallel sessions on thematic topics. At the same time, we also celebrated INBAR's last 25 years of development, as our network grew from humble bamboo shoots to a flourishing interconnected forest, culminating with the launch of the Concept Note of the Bamboo as a Substitute for Plastic Initiative.

INBAR's international influence continued to expand in 2022. We vigorously made the case for bamboo and rattan at prominent events, speaking at plenary sessions as well as organizing booths and side events at UN conferences on biodiversity, desertification, climate change and forestry. Our global partnerships also deepened, as we joined ranks with countries to protect African forest land in the Congo Basin and became an official partner of the New European Bauhaus to promote sustainable bamboo construction and incorporate bamboo in public spaces in Europe.

In 2022 our regional advocacy work broke new ground. In April, the African Bamboo and Rattan Congress convened in Yaoundé, Cameroon, uniting stakeholders from 19 countries. Featuring a Ministerial Dialogue, bamboo and rattan exhibition and break-out sessions, the Congress also passed the Yaoundé Declaration before the event concluded, which represents the collective vision for using bamboo and rattan to drive Africa's green economy. And in Peru, the Seventh International Bamboo and Guadua Symposium was successfully convened, welcoming over 200 luminaries to discuss bamboo development and explore new forms of collaboration as well as share bamboo design technologies, housing projects and lessons learnt.

The numbers also tell us a convincing story. In 2022, we published 225 articles, over 20 major publications including books, working papers and reports, all the while carrying out regular programmatic work on over a dozen projects. In webinars and trainings, our network of experts reached over 4000 global users and producers of bamboo and rattan. Two new international standards were published, one for the classification of raw and finalized rattan products, and one on engineered bamboo for structural uses. And, at the country level, Kenya and Peru unveiled national bamboo strategies.

I am very proud of our achievements in 2022, and looking forward to building on them in 2023. Thank you for your gracious support over the years!

**ALI MCHUMO**

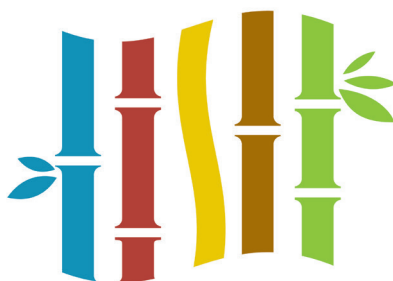
INBAR Director General



# CELEBRATION OF INBAR'S 25<sup>TH</sup> ANNIVERSARY AND THE SECOND GLOBAL BAMBOO AND RATTAN CONGRESS



国际竹藤组织成立25周年  
INBAR 25<sup>th</sup> Anniversary



**BARC 2022**  
7-8 November, Beijing



In 2022, we looked back on INBAR’s 25 years of impressive growth. Since our founding in 1997 with the mission to “improve the well-being of producers and users of bamboo and rattan within the context of a sustainable bamboo and rattan resource base, by consolidating, coordinating and supporting strategic and adaptive research and development,” it has been demonstrated time after time the institutional wherewithal and clarity of vision with which INBAR has advanced its sustainable mission.

▲  
*The Opening Ceremony of BARC 2022 kicked off in Beijing, China.*

Expanding from 9 to 50 Member States, our reach has never been further. With hundreds of partnerships across our interconnected network, our alliances have never been stronger. As an official Observer to the United Nations (UN) conventions on biodiversity, climate change and desertification as well as the UN General Assembly, bamboo and rattan have never enjoyed such an elevated status. And with our workshops reaching over 150,000 people and conducting projects, research, trainings and study visits in over 80 countries, our on-the-ground project work has never been more impactful.

In November, the Celebration of INBAR’s 25<sup>th</sup> Anniversary and the Second Global Bamboo and Rattan Congress (BARC 2022) convened in Beijing under the theme “Bamboo and Rattan — Nature-based Solutions for Sustainable Development,” providing us the opportunity to celebrate our accomplishments with our partners, forge new alliances and plan the next decade of sustainability with bamboo and rattan.

At the Opening Ceremony, a letter from Chinese President Xi Jinping was read out. In it, President Xi praised INBAR’s “constructive role in promoting eco-environmental protection and sustainable development globally” with bamboo and rattan. Xi further highlighted that the “Chinese government and INBAR join hands to implement the Global Development Initiative and jointly launch the Bamboo as a Substitute for Plastic Initiative so as to reduce plastic pollution in all countries, address climate change, and accelerate the achievement of the United Nations’ 2030 Agenda for Sustainable Development.” The Initiative is set to become a roadmap for using bamboo to address the scourge of plastic pollution in cooperation with INBAR, Member States and other partners around the world.

Three video messages from Cameroonian President Paul Biya, Ecuadorian President Guillermo Lasso and Ethiopian President Sahle-Work Zewde were also broadcast at the Opening Ceremony. In their messages, they affirmed INBAR's mission over the years, speaking on their countries' positive experiences as INBAR Member States and the important role of bamboo and rattan as vital natural resources. Public statements from national leaders are critical for rallying public support for the green transition of the world, mobilizing stakeholders into action. Their words can have a profound impact on national economies, consumer habits, regulatory oversight practices, trade patterns and more, nudging the public into a greener direction.

Video messages from Li Junhua, Under-Secretary-General of the United Nations (UN) Department of Economic and Social Affairs (DESA), Qu Dongyu, Director-General of the Food and Agriculture Organization (FAO), Gerd Müller, Director-General of the UN Industrial Development Organization (UNIDO), and Alvaro Lario, President of the International Fund for Agricultural Development (IFAD) were also shown on stage in which they championed nations and actors around the world engaged in the global project of the green transition. Their words inspire citizen action, highlighting local communities, and bring networks and partnerships to the practitioners who are most vulnerable to the effects of climate change. INBAR works with these allies on the frontlines of a variety of global challenges.

Later in the Opening Ceremony, the Concept Note of the Bamboo as a Substitute for Plastic Initiative was officially co-launched by the Government of China and INBAR. This Initiative will act as a roadmap for radically scaling up the use of bamboo to replace plastics, with the aim of making a serious dent in climate change, reducing plastic waste and contributing to carbon neutrality.

Next, a video message from Antón Leis García, Director of the Spanish Agency for International Development Cooperation (AECID), kicked off the Ambassadors' Dialogue. In his speech, he touted bamboo as a symbol of green economy project work as well as a strategic resource for forging global alliances across the many countries where AECID cooperates with INBAR. Afterward, Martin Mpana, Ambassador of Cameroon to China, Leonardo Kam, Ambassador of Panama to China, Carlos Larrea, Ambassador of Ecuador to China, Teshome Toga Chanaka, Ambassador of Ethiopia to China, and Carlos Watson, FAO Representative to China took the stage to discuss how to best implement the Bamboo as a Substitute for Plastic Initiative as well as integrate bamboo into development strategies and plans. They also introduced relevant policies, regulations, norms and laws regarding plastic bans or restrictions in their countries or respective fields. Consensus was reached on the importance of establishing effective incentive and disincentive structures to help guide the public transition from plastic materials to other ecological alternatives while navigating potential emergent obstacles. Other topics mentioned during the dialogue included new technologies, investment approaches, the deployment of financial mechanisms and erecting a supportive framework to encourage market development.

Keynote speeches from luminaries who work with bamboo capped off the day's agenda. Professor Jiang Zehui, Co-Chair of the INBAR Board of Trustees, Chief Scientist of the International Centre for Bamboo and Rattan, China and Academician



of the International Academy of Wood Sciences; Christophe Besacier, Senior Forestry Officer of FAO and Coordinator of the Forest and Landscape Restoration Mechanism; Professor Yin Weilun, Academician of the Chinese Academy of Engineering and former President of Beijing Forestry University; and Dr. Pablo van der Lugt of Delft University of Technology, the Netherlands, delivered topical presentations to the audience. Respectively, topics ranged from the threat of plastic pollution to human and planetary health; ecosystem restoration efforts happening around the world; the integration of carbon neutrality with high-quality sustainable development; and the untapped potential of engineered bamboo to curtail pollution and carbon emissions from the construction industry. Across all presentations, bamboo and rattan were identified as versatile tools for ushering in a shared future that is cleaner and greener.

▲  
*Ambassadors, state officials, department chiefs, intergovernmental leaders and other VIPs were present at BARC 2022.*

On the second day of BARC 2022, 35 parallel sessions were organized. Over 1000 participants from INBAR Member States and Observer States, international organizations and non-governmental organizations as well as research institutes, universities and enterprises participated in the hybrid online-offline event. Topics were divided across four themes: The Road to Carbon Neutrality; Green Industry and Economic Recovery; Innovative Materials and Market Development; and Working Together for Inclusive and Green Development. These parallel sessions represented the beating heart of the Congress, gathering stakeholders with diverse backgrounds to exchange lessons learnt, best practices and expert knowledge with colleagues in other fields. The conversations held across these sessions are critical for building the informal links that undergird formal partnerships, collaborative endeavors and joint programs of the future that will tackle global issues.

BARC 2022 and events like it are ideal platforms for building consensus, allowing us to collectively rise and meet the challenges of our time, from alleviating rural poverty and mitigating climate change to healing degraded soils and safeguarding vital ecosystems. INBAR's achievements over the last 25 years are testament to our growing impact and that the world is hungry for nature-based solutions. As we continue to unlock the potential of bamboo and rattan, these forest resources will be brought to bear in a variety of arenas, activating countless knock-on benefits for communities around the world and galvanizing countries in the fight for our planet.

# BAMBOO AS A SUBSTITUTE FOR PLASTIC INITIATIVE

Plastics are ubiquitous in modern lives, with applications in packaging, construction, textiles and more. However, with approximately 400 million tonnes of plastic waste generated annually, there are severe drawbacks to the world's embrace of material. Over the last fifty years, billions of tonnes of plastics have ended up in landfills or discarded in natural environments, which wreak havoc on terrestrial and marine ecosystems. Plastic waste leaches harmful chemicals into soils, contaminating farmland, and chokes out ocean life, damaging aquatic habitats. Moreover, they are mainly produced by fossil fuels and have been catastrophic for accelerating climate change.

A new generation of plastic alternatives are being worked on in labs around the world. Bio-based plastics, which rely on plant matter, are one of them. These bioplastics do not rely on fossil fuels for production, and their carbon footprints are much smaller than their virgin-plastic counterparts. Bamboo can be an ideal source of raw material for bioplastics given its fast-growing nature as well as ability to be harvested annually while storing and sequestering carbon. However, bioplastics comprise just 1% of the plastics generated each year, suggesting the enormous potential for scaling up bamboo use. Urgent, targeted global action is needed, particularly given the transboundary nature of the problem across food chains, biodiversity protection and carbon emissions.

INBAR has been advocating for bamboo as a plastic substitute at UN conferences, international fairs and other major events, which culminated in June 2022 when the Bamboo as a Substitute for Plastic Initiative was included as one of the deliverables at the High-level Dialogue on Global Development at the 14<sup>th</sup> BRICS Summit. Set to co-launch in collaboration with INBAR, the Initiative aimed to radically scale up the use of bamboo as a renewable resource to reduce plastic pollution and address climate change. Later in September, China's State Councilor and Foreign Minister Wang Yi announced that China and INBAR would launch of the Global Action Plan of the Initiative, which was a clarion call to mobilize INBAR Member States and the international community to achieve the goals of the Initiative. This momentum reached a crescendo at BARC 2022 in November, when INBAR and the Government of China formally launched the Concept Note of the Bamboo as a Substitute for Plastic Initiative.

Professor Jiang Zehui, Co-Chair of INBAR Board of Trustees, used her keynote presentation at BARC 2022 to introduce the Initiative. Aimed at deepening cooperation of the Global Development Initiative (GDI) while making a positive contribution to the 2030 Agenda for Sustainable Development, the Initiative is guided by five underlying principles: 1) Formulate sustainable policies; 2) Promote technological innovation; 3) Encourage scientific research; 4) Promote market expansion; and 5) Enhance publicity. It is through the synergy of these underlying principles that the



Initiative will realize the true potential of bamboo as a nature-based solution for energy-intensive and difficult-to-degrade plastic products.

Her presentation detailed how the Initiative will achieve its goal of replacing plastics with bamboo, showcasing innovative applications and products in areas like construction, tableware, industrial appliances, interior design and handicrafts. The countless ecological benefits of bamboo as a bio-based low-carbon solution were outlined, as well as its capacity to help the world reach its carbon neutrality goals. At the same time, it can also help meet growing consumer demand for green alternative products. As an important part of landscapes around the world, particularly in the Global South, bamboo plays a key role in rural economies and ecotourism. However, many countries are yet to scale up their bamboo resources, and when done in concert with plastic substitution, this could help smallholders increase income while addressing pollution and climate change.

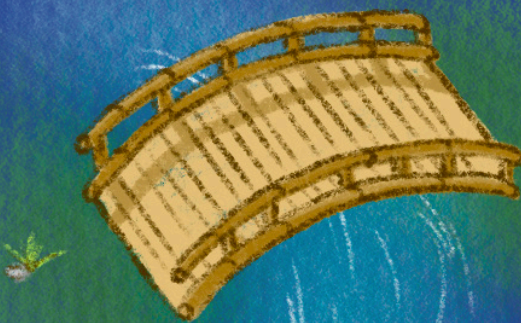
On the second day of BARC 2022, a parallel session was held on Replacing Plastics with Bamboo: Policy, Roadmap and Actions, hosting speakers from the UN Environment Programme (UNEP) and other partner organizations engaged in halting and remediating plastic pollution. The keynote speech was delivered jointly by Dr. Jyoti Mathur-Filipp, Executive Secretary of Intergovernmental Negotiating Committee (INC) on Plastic Pollution of UNEP, together with Dr. Han Meng, UNEP-WCMC China. Deliberations during the session highlighted the need for an international legal instrument to end plastic pollution and strategically reduce plastic use while facilitating systematic transformation that considers the interconnection between plastics and climate change, biodiversity loss, human health and food security. After BARC 2022, INBAR touted the Bamboo as a Substitute for Plastic Initiative at the UN Climate Change Conference and UN Biodiversity Conference.

The current historic moment presents a clear choice to humankind: More plastics, more pollution and more greenhouse gas emissions, or cleaner lands, cleaner seas and cleaner air. INBAR, with the launch of the new Initiative, has made its choice, and will press on at the vanguard to create a cleaner and greener world.

▲  
*Bamboo materials can play an important role in reducing the huge amount of plastic waste generated each year.*  
Credit: Kyaw Zay Yar Lin.

# POLICY SHAPING

*INBAR continued to support the inclusion of bamboo and rattan in socioeconomic and environmental development policies at national, regional and international levels.*



## INBAR embraces Chad into its ranks

In September 2022, INBAR welcomed Chad as its 49<sup>th</sup> Member State and 21<sup>st</sup> Member State in Africa. Prior to becoming a full member of INBAR, Chad had a long relationship with INBAR as an Observer to the organization. In April 2022, high-level officials from Chad attended the First African Bamboo and Rattan Congress (ABARC) convened in Yaoundé. In 2020 and 2022, the INBAR Director General accompanied by INBAR Regional Director for Central Africa also made several visits to Chad and held bilateral strategic meetings with authorities in Ndjamena, the capital city.

In certain regions of the country, particularly the southeast, bamboo is a key resource and material used daily to make agricultural tools such as hoes, axes and fences. Bamboo is also used for making furniture, with applications in construction, boosting the livelihoods of local communities. However, smallholders face difficulties in obtaining bamboo seedlings and tend to lack the technical know-how for cultivation, challenging the standardization of bamboo management.

INBAR will work in tandem with government actors and other partners in the country to generate tailor-made solutions to address these challenges and support the sustainable development of the country's bamboo and rattan sector, with the main goal of tackling environmental and economic issues through South-South cooperation as well as technology and solutions transfer.

## Strengthening the Rio Conventions with bamboo and rattan

In 2022, INBAR made the case for bamboo and rattan at the meetings of each Rio

Convention, including the 15<sup>th</sup> Conference of the Parties to the Convention on Biological Diversity (UNCBD COP 15), the 15<sup>th</sup> Conference of the Parties to the UN Convention to Combat Desertification (UNCCD COP 15), and the 27<sup>th</sup> Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC COP 27).

UNCBD COP 15 was divided into two parts. The first part occurred in Kunming, China, where INBAR attended as an Observer in October 2021. The second part was held in December 2022 in Montreal, Canada, where Pablo Jácome, INBAR Regional Director for Latin America and the Caribbean, delivered INBAR's statement at the high-level plenary session, highlighting the role of bamboo and rattan as nature-based solutions that provide valuable ecosystem services, restore degraded landscapes and store carbon. INBAR Deputy Director General Lu Wenming also gave the opening remarks at a side event, where he touted the flexible applications of bamboo in national strategic planning.

INBAR also organized the session Bamboo for Ecosystem Restoration and Green Growth at UNCCD COP 15 in Abidjan, Côte d'Ivoire. In his opening remarks, INBAR Deputy Director General Lu Wenming emphasized that bamboo forests cover at least 35 million hectares of land globally and have important cultural significance. Other speakers at the event included Durai Jayaraman, INBAR Global Programme Director, and Rene Kaam, INBAR Regional Director for Central Africa. They discussed the wide range of applications of bamboo in land restoration such as its ability to grow on poor sloping soils as well as bind and protect topsoil; its permanent canopy cover and leaf litter; its importance as a fast-growing harvestable material; and its function as a carbon sink. Bamboo

was also noted as capable of playing a role in contributing to global initiatives like the Bonn Challenge and New York Declaration, which aims to restore 350 million hectares by 2030.

At UNFCCC COP 27 in Sharm El-Sheikh, Egypt, bamboo was highlighted at the UNFCCC Global Innovation Hub as a promising green material for sustainable construction. Since 2022, INBAR and UNFCCC have been working to enhance the inclusion of bamboo in Nationally Determined Contributions by framing a programmatic roadmap within a Memorandum of Understanding (MoU), which was announced to be launched at the next meeting of UNFCCC. INBAR also organized two side events at the meeting. The first event, The Potential of Bamboo as a Material for Sustainable Construction and Circular Economic Development, featured INBAR Deputy Director General Lu Wenming delivering the opening remarks, where he spoke on the applicability of bamboo-based materials to contribute to carbon neutralization goals by mitigating emissions in the construction sector. The Bamboo as a Substitute for Plastic Initiative, the second event, hosted speakers from the public and private sectors to discuss potential pathways for mainstreaming bamboo products and reducing plastic waste. INBAR also showcased products made with bamboo materials at an exhibition and attended a panel discussion on promoting nature-based solutions for climate change and biodiversity.

### **Growing INBAR partnerships in Africa and Europe**

Named an official partner of the New European Bauhaus, INBAR's recent inclusion signals the thriving relationship between INBAR and the European Union. Deepening ties reflect the

bilateral commitment to set up networks and solutions for shared living spaces that are beautiful, sustainable and affordable, in line with the mandate of the European Green Deal, and exploring the possibilities for leveraging bamboo to support this endeavor. The New European Bauhaus will function as a platform for further productive exchange on sustainable construction, standards, research and innovation, re-imagining a sustainable future with aesthetic sensibility and design at the center of such discussions, and unlock funding opportunities for designing and building bamboo structures in public spaces.

INBAR was also welcomed into the ranks of the Congo Basin Forest Partnership (CBFP), which is a broad coalition of countries and organizations working together to promote sustainable resource management, improve living conditions and protect the biodiversity of Central Africa's tropical forests. As the 124<sup>th</sup> member of the CBFP, INBAR will cooperate with multilateral stakeholders to champion the role of bamboo in sustainable development schemes across the region. INBAR's Central Africa Regional Office will coordinate the implementation of a series of technical and financial measures to streamline efficiency and bolster the sustainable management of forest ecosystems, mitigate the effects of climate change and accelerate poverty alleviation efforts in Central Africa.

### **Flying the INBAR flag worldwide**

From 20 to 22 April, INBAR and the Government of Cameroon organized and convened ABARC in Yaoundé, Cameroon under the theme "Making Bamboo and Rattan the Engine of a Resilient and Sustainable Green Economy in Africa."

The event hosted ministers, experts and delegations from 19 different countries, who met to set Africa's sustainable agenda. The Congress also received messages from senior representatives at IFAD, FAO, UNIDO, AECID and the UN Forum on Forests (UNFF).

The Congress featured an Opening Ceremony that hosted a Ministerial Session in which ministers deliberated on how INBAR could better serve its Member States, and elucidated a joint vision on the strong development of Africa's bamboo and rattan resources; a bamboo and rattan exhibition which showcased the range of bamboo and rattan products and handicrafts produced in Cameroon; break-out sessions on a wide range of topics like green development and the circular economy, policies and strategies for mainstreaming the bamboo and rattan sectors, resource mobilization, and bamboo for bio-energy research and development; and finally, as part of the Closing Ceremony, the Yaoundé Declaration was announced, summarizing recommendations from the Congress and acting as a roadmap for bamboo and rattan to drive Africa's green development.

Delayed because of the COVID-19 pandemic, the XV World Forestry Congress (XV WFC) convened in Seoul, Korea under the theme "Building a Green, Healthy and Resilient Future with Forests" in early May 2022. INBAR organized two side events at the Congress. The first side event, Delivering Multiple Benefits for People and the Earth through Bamboo, hosted panelists from INBAR, RECOFTC, IFAD and FAO, as well as high-level officials from Africa and leaders in the private sector. The side event highlighted the valuable ecosystem services provided by bamboo as well as mentioned the versatile nature of the grass plant in generating livelihoods for

rural communities and helping nations reach zero carbon goals. The second side event, Bamboo as a Sustainable Biomass Energy for Africa, welcomed colleagues from INBAR, the International Centre for Bamboo and Rattan, China (ICBR), the Minister of Energy of Ethiopia as well as bamboo enterprises from Ghana and Ethiopia. In the session, experiences and lessons learned were shared regarding the use of bamboo as a form of biomass energy. Its renewable nature was emphasized, and strategies were discussed for the dissemination of its broader use across Africa.

The UN Conference on Trade and Development (UNCTAD) organized its 13<sup>th</sup> session of the Multi-Year Expert Meeting on Commodities and Development from 10 to 12 October 2022. One full day of the session was allocated for discussing bamboo as a commodity. This day was intended to explore aspects of the bamboo value chain that are especially important for developing countries, including opportunities for the value addition of raw bamboo, challenges in the downstream processing of bamboo, the advantages of bamboo as a construction material and the multifunctional uses of bamboo in climate change mitigation schemes.

To inform policy options for developing the bamboo sector, experiences and lessons were exchanged between participants at the expert meeting. An interactive panel discussion included participants from bamboo-producing and importing countries, from government officials to stakeholders from the private sector and civil society. INBAR vigorously participated in the panel, speaking on bamboo's market development and environmental applications. At the end, the Secretariat of UNCTAD was encouraged to collaborate with INBAR to carry out joint activities that robustly



▲ INBAR organized two side events at the World Forestry Congress in Seoul, Korea to promote the role of bamboo and rattan in forestry.

support the development of the bamboo sector, including the organization of regional commodity days in Africa and Latin America.

To combat the growing plastic crisis, the Intergovernmental Negotiating Committee (INC) was established within UNEP to develop an international legally binding instrument on plastic, including in the marine environment. INBAR participated in the first session of the INC on 28 November, submitting a written statement alongside other international organizations in attendance. The statement makes the powerful case for the capacity of bamboo to act as a green alternative material to curb plastic pollution, drawing attention to the Bamboo as a Substitute for Plastic Initiative. The Initiative seeks to strengthen the usage of bamboo as a green alternative to plastics in order to address plastic pollution and climate change while contributing to the GDI.

Bamboo, as a green, low-carbon, fast-growing, renewable and degradable biomass material, can play a unique role in not only addressing global challenges like plastic pollution but also climate change, poverty alleviation and

ecological restoration. INBAR's unique role as an intergovernmental organization with numerous Member States spread across the Global South makes it well positioned to contribute to the design and implementation of such an international legally binding instrument on plastics.

### Land cleared for China-Africa Bamboo Center

The land acquisition process for construction of the China-Africa Bamboo Center in Ethiopia continued smoothly in 2022. Recently, the Addis Ababa City Administration Bureau issued the temporary land leasehold certificate. Following this, the Ethiopian Forest Development Office organized a committee to support and facilitate conducting a feasibility study for the construction of the site. This construction project was first initiated when INBAR's East Africa Regional Office organized the first Africa Bamboo Summit and the 9<sup>th</sup> INBAR Council Meeting took place in Addis Ababa in November 2014. Since then, INBAR has continued with the necessary preparatory work on land acquisition and other legal



and regulatory procedures, regularly meeting with government officials and developers. The construction has a high level of support from INBAR Member States who emphasize the importance of a bamboo center for the Africa.

### National policies streamlining management of bamboo and rattan

In 2022, Kenya's Ministry of Environment and Forestry unveiled its National Bamboo Policy, which allows Kenyans to grow and harvest bamboo for environmental conservation and value addition. The policy aims to develop a vibrant bamboo sub-sector through sustainable management, increasing the area coverage of bamboo and enabling commercialization. The document erects a framework for improved governance, resource allocation, partnerships and collaboration between state and non-state actors. Bamboo will play a key role in contributing to Kenya's Vision 2030 plan, which seeks to bring the country to middle-income status by 2030.

Peru's Ministry of Agrarian Development and Irrigation also announced the launch of the National Bamboo Strategy

2022–2025. The Strategy is a medium-term document that will guide the development of the bamboo sector in the country. Its main objective is to promote and strengthen bamboo production and the value chain as well as foster strategic conditions for formalizing the sector, strengthening management, bolstering use and facilitating the transformation of bamboo to provide higher-quality bamboo products and bring them to the national market. By 2025, Peru expects to have planted and registered 4400 hectares of bamboo, building the capacities of 3000 actors on bamboo management skills.

In May 2022, Colombia announced the passage of Law No. 2206, with the objective of adopting a policy framework that encourages the productive use of Guadua bamboo in different sectors of the economy and for leveraging its benefits to mitigate the effects of climate change. The law is built upon the Competitiveness Agreement for the Bamboo Productive Chain and Agro-industry 2020-2030 and Resolution No. 000009 of the Ministry of Agriculture and Rural Development, which initially established the National Council of the Productive Chain of Bamboo and its Agro-industry in 2021.

▲  
INBAR showcased bamboo products at the UN Climate Change Conference in Sharm El-Sheikh, Egypt.

# REPRESENTATION AND ADVOCACY

*INBAR's Regional Offices continued to engage with countries around the world to raise awareness about bamboo, rattan and INBAR's work.*





## Central Africa

In 2022, INBAR's Central Africa Regional Office ramped up its membership outreach efforts, leading to the Republic of Chad becoming INBAR's 49<sup>th</sup> Member State and its Government including bamboo as a key resource in the fight against desertification. The Office also laid the groundwork for the Democratic Republic of the Congo becoming INBAR's 50<sup>th</sup> Member State in early 2023 by facilitating high-level meetings with officials, including with the country's Prime Minister, helping bring bamboo and rattan development strategies to new areas of Central Africa.

In April, the Office partnered with Cameroon's Government to convene ABARC, a landmark Congress that culminated in the announcement of the Yaoundé Declaration. This document represents the joint vision of bamboo and rattan sector development in Africa. In addition, the Office strongly advocated for bamboo and rattan as sources of green bioenergy, renewable construction materials, sustainable incomes, providers of ecosystem services and generators of diverse products at a number of prominent international events such as XV

WFC, UNCCD COP 15, the 19<sup>th</sup> Meeting of the Parties of the CBFP, Africa Climate Week, World Bamboo Day and the 13<sup>th</sup> Session of UNCTAD, raising awareness among vital stakeholders in the private sector, government agencies, development organizations and more on the sustainable uses of bamboo and rattan.

## East Africa

In 2022, the East Africa Regional Office undertook a number of activities to advance bamboo development in the region. The Office organized two side events and showcased a bamboo exhibition at UNFCCC COP 27 in Sharm El-Sheikh, Egypt, representing INBAR's agenda on using bamboo for sustainable construction and the circular economy as well as bamboo's capacity to replace plastics. The Office also arranged two workshops to raise awareness and sensitize stakeholders in Burundi and Eritrea on opportunities and challenges in the bamboo sector while exploring new partnerships for the co-development of bamboo projects in these countries with stakeholders from academia, government agencies and the private sector. Office staff also supported two

▲  
*African policymakers and other high-level officials from around the world were in attendance at ABARC in Yaoundé, Cameroon.*



▲  
*Sensitization outreach in Eritrea raised awareness with key stakeholders in Eritrea about the potential of bamboo and rattan for sustainable development.*

other regional workshops focusing on the development of bamboo standards as well as Forest Stewardship Certification and Chain of Custody to promote better policies and build capacities in the region.

Bamboo is an abundant but underutilized resource in East Africa. The Office has been working to enable communities to sustainably add value to raw bamboo materials and help grow the sector as part of its project portfolio. Under the Dutch-Sino-East Africa Programme: Phase II project, the Office has organized three cross-learning study tours in Ethiopia, Kenya and Uganda for stakeholders, which is an important step for generating a conducive environment for the cross-pollination of ideas on regional bamboo sector initiatives. Aiming to create new financial linkages and green investment schemes, the Office also hosted international investors from the United Arab Emirates and Korea, connecting them with local business counterparts at bamboo sites in Ethiopia and Kenya. Technical and project development support also continued for the newly launched AECID-Ethiopia Bamboo Supply Chain Project, which aims to contribute to building a circular economy

and resilience to climate change through the development of a bamboo-based supply chain in Ethiopia by 2024.

## West Africa

INBAR's West Africa Regional Office redoubled its efforts to facilitate bamboo-planting activities under the national "Green Initiative" implemented by the Government of Ghana, which seeks to plant five million trees annually. INBAR is contributing to the policy by planting one million bamboo seedlings. The Office has also been working with Ghana's Bamboo and Rattan Unit to donate and plant seedlings along the banks of the Volta River.

The Office also organized events to engage a wide range of stakeholders to leverage different perspectives and capacities for bamboo and rattan sector growth. In June, the Office organized the National Bamboo Development Policy Round-Table Meeting in Ghana to promote precise regulatory policies to create a favorable business environment for bamboo sector development. The Office also hosted a workshop in Togo to sensitize leaders at departments and agencies



at Togo's Ministry of Environment on the multifunctional roles played by bamboo and rattan as nature-based solutions for job creation, poverty reduction, safeguarding the environment and fighting climate change. Ghana's Ministry of Lands and Natural Resource and other partner organizations in the country's government also co-hosted a product exhibition with INBAR, showcasing bamboo and rattan products to commemorate INBAR's 25<sup>th</sup> anniversary.

## South Asia

INBAR's South Asia Regional Office continued to reinforce partnerships with stakeholders in the region while supporting South-South and South-South-Triangular Cooperation.

The efforts paid off, leading to a new collaboration with GiZ for a triangular cooperation project between India, Germany and Ghana to support bamboo-based enterprise development and create sustainable high-value economic opportunities for farmers, artisans, micro and small enterprises, designers, traders and exporters. The Office with the support of GiZ designed

learning modules on bamboo harvesting and post-harvesting technology for farmers, also organizing a training program for the staff of Dalmia Cement and other farmer leaders, highlighting bamboo-based energy options in the public-private partnership. The Office has also successfully implemented two projects with the Commonwealth Educational Media Centre for Asia (CEMCA) to transfer technical knowledge, skills and technologies for making engineered bamboo products, such as scrimber, laminated composites and value-added products as well as bamboo-based furniture, producing 24 audio-visual modules in English on technical and managerial aspects of engineered bamboo. Multi-language translation boosted the reach of the knowledge products across Bangladesh, Brunei, Malaysia and Sri Lanka.

In addition to robust project activities, the Office actively organized and participated in a number of trainings on the uses of bamboo, including a three-day training program on Bamboo Scrimber, Laminated Composites and Value-Added Products with CEMCA which hosted over 300 participants from over 40 countries; an orientation

▲  
*INBAR has delivered knowledge and skills on value addition such as bamboo weaving to smallholders in India.*



▲  
*INBAR hosted a training on bamboo propagation as part of the Inter-Africa project.*

program for bamboo entrepreneurs on the Development of the Bamboo Industry in Sri Lanka with support from Sri Lanka's Ministry of Industries; a training program to accelerate the mainstreaming of bamboo as a green alternative to timber for exporters; and a workshop on Regional Partnerships for Biodiversity Conservation and Sustainable Development.

The Office collaborated with the private sector to organize a start-up workshop to build awareness about the economic potential of bamboo, helping new companies implement innovative product designs and ideas such as bamboo boats as well as packaging and industrial materials. Office staff also participated in the National Stakeholder Consultation on Determining the Scope and Feasibility of a Value Chain Alliance for Wood, which brought together diverse stakeholders to build consensus on the integration of bamboo into India's value chain for construction materials.

### **Latin America and the Caribbean**

In 2022, INBAR's Latin America and the Caribbean Office made great strides for

seeking out opportunities to enlarge INBAR membership while also continuing to provide technical and policy support to its Member States across a variety of events and activities.

Interest in the region is growing for the use of bamboo. In Guyana, INBAR partnered with the local Chinese Embassy and Ministry of Local Government and Regional Development to organize the Overseas Training Course on Bamboo Weaving Technology for 60 participants, significantly boosting interest in the forest resource and establishing new links between high-level officials for membership outreach. The Office also participated in the 37<sup>th</sup> FAO Regional Conference for Latin America and the Caribbean in Ecuador in March, where bilateral meetings were held with Nicaragua's Minister of Agriculture and El Salvador's Vice-Minister of Agriculture to discuss the prospect of INBAR membership and expanding project development. In addition, special missions were conducted in Costa Rica and the Dominican Republic to meet with high-level authorities where it was emphasized how INBAR membership can support bamboo-based development in these countries.



The Office continued to undertake project work in the region. Working closely with the Government of Ecuador and AECID, a sustainable bamboo house prototype was completed as part of the Manabí Workshop School in Sustainable Bamboo Housing Construction project. Ecuador's President participated in the launching ceremony, pledging Ecuador would integrate bamboo homes into the housing program, helping to generate new green jobs. These homes will play a critical role in helping to revitalize local economies, address the housing deficit and develop solutions that mitigate climate change, tapping into Ecuador's significant natural bamboo resources

The Office also regularly participated in trainings, workshops and other project-related events throughout the region, including helping organize the Regional Exchange of Bamboo Experiences at the SENA Institute in Colombia, educating over 25 participants from Ecuador and Peru about the sustainable management, uses and commercialization of bamboo, as well as another workshop on sustainable bamboo construction in Venezuela, where stakeholders learned how to build with bamboo over the five-day course.

In Colombia, Ecuador and Peru, over 20 awareness-raising activities were held with high-level national and local authorities. These events included the International Seminar on Policies and Industrial Development of Bamboo, with over 110 participants, and the Seventh International Bamboo and Guadua Symposium (SIBGUADUA), which attracted over 200 participants. Staff from the Office also participated in and presented at numerous important international events and conferences, including the UNCBD COP 15, UNFCCC COP 27, UNFF 17, XV WFC and more, where they represented INBAR's sustainable agenda and showcased advances, innovations and lessons learned from the bamboo sector in Latin America and the Caribbean.

## China

Despite challenge posed by the COVID-19 pandemic, activities in INBAR's Host Country proceeded uninterrupted in 2022.

The Celebration of INBAR's 25<sup>th</sup> Anniversary and the Second Global Bamboo and Rattan Congress convened in November, bringing together hundreds of policymakers, researchers,

▲  
*Ecuadorian President Guillermo Lasso participated in the launching ceremony of the Manabí Workshop School.*



▲ INBAR's prominent booth was one of the main attractions at CIFTIS 2022 in Beijing.

entrepreneurs and more to advocate for bamboo and rattan as nature-based solutions for sustainable development across the two-day event. The event featured an Ambassadors' Dialogue, keynote speeches and parallel sessions as well as an online exhibition.

As part of the Opening Ceremony, the Government of China and INBAR co-launched the Concept Note of the Bamboo as a Substitute for Plastic Initiative, which is designed to act as a roadmap for radically scaling up bamboo to reduce plastic pollution and address climate change. Currently, bioplastics represent only 1% of the 400 million tonnes of plastic produced each year, suggesting the immense potential for bamboo. The Initiative builds on years of work INBAR has done in promoting bamboo as an alternative low-carbon material to plastics, with many knock-on benefits in carbon neutrality, environmental production and poverty alleviation.

At the 2022 China International Fair for Trade in Services (CIFTIS), INBAR designed and operated a 120 m<sup>2</sup> bamboo pavilion displaying a range of bamboo products in collaboration with five local governments and eight leading

bamboo enterprises, which was one of the main attractions for visitors at the fair. INBAR also organized a symposium on the Bamboo as a Substitute for Plastic Initiative in which more than 30 government officials, experts and entrepreneurs participated, discussing the advantages and prospects of replacing plastic with bamboo and how to further promote the implementation of the Initiative. As part of BARC 2022, Chinese partners and enterprises were invited to participate in the online exhibition for displaying a wide range of high-quality products, advanced technologies and cutting-edge research achievements. Some of these included bamboo and rattan furniture, construction materials, artistic crafts, daily use products, fiber, charcoal and more.

INBAR also enhanced its cooperation with local governments, scientific research institutes and enterprises in China in 2022, signing dozens of MoUs and three new agreements with local governments in Sichuan, Hunan and Zhejiang. INBAR also participated and supported the International Charity Sale organized by the Ministry of Foreign Affairs of China, raising funds for philanthropic causes with donated bamboo



products. Finally, INBAR Headquarters continued to receive high-level guests from China’s ministries and diplomats from embassies, conducting tours for visitors of the Bamboo and Rattan Showroom and highlighting the versatile nature of the plants while introducing the organization’s history and mandate in the sustainable development sphere.

INBAR presence was also felt at major bamboo events remotely, ensuring our messaging was connecting with stakeholders even with travel restrictions in place. Video speeches by INBAR Director General and Deputy Director General were broadcast at the 2022 International Bamboo Industry Brand Expo and the Third China (Yibin) International Bamboo Industry Development Summit in Yibin, Sichuan; the 2022 China International Bamboo Industry Fair in Qingshen, Sichuan; and the 2022 International Yong’an Bamboo Expo (Online). In their speeches, they remarked on the special role INBAR and local governments are playing in leading efforts to integrate bamboo into sustainable development programs, emphasizing the scientific innovation of bamboo and rattan as well as the Bamboo as a Substitute for Plastic Initiative.

### Capturing the vibrancy of bamboo and rattan

This year marks the third consecutive year of the INBAR International Bamboo and Rattan Photo Competition. Competition was fierce, with almost 200 photos from 22 countries. The winning submissions were showcased at BARC 2022. From top-left going clockwise:

First place, Best of Bamboo – “Bamboo Scaffolding” by Kyaw Zay Yar Lin from Myanmar

First place, Best of Rattan – “Rattan Basket for Durians” and second place “Bamboo in Cow Races” by Muhammad Syarif. S from Indonesia

Second place – “City Spiders” by Wong Chi Keung from Hong Kong, China

Second place – “Rattan Collectors” by Pyi Soe Tun from Myanmar

Third place – “Sustainable Fishing” by Sujan Sarkar from India

Third place – “Sandur kalongking folk show” by Wahyu Budiyanto from Indonesia (Not pictured)

▲  
Photos submissions included a diverse assembly of cultural and economic practices with bamboo and rattan.

# ACTION RESEARCH AND COUNTRY SUPPORT

*INBAR continued to pilot case studies and facilitate the exchange of best practices across its Member States.*





## Scaling up bamboo to end poverty, create jobs and safeguard nature

In 2022, the Dutch-Sino East Africa Bamboo Development Programme: Phase II project, funded by the Ministry of Foreign Trade and Development Cooperation of the Netherlands as well as the National Forestry and Grassland Administration of China, continued to facilitate the transfer of bamboo knowledge, technologies and policy experiences from China and Europe to Ethiopia, Kenya and Uganda. The project has made great strides in developing a reliable supply chain, small and medium enterprises (SMEs) and industries, capacity and skill-building, research and technology, market development, restoration and sustainable management of bamboo resources, as well as replicating best practices in the bamboo sector.

Part and parcel of this mission, the program has strengthened pro-poor industries and SMEs, generating inclusive job opportunities, improving livelihoods and empowering communities through its targeted capacity and skill-building. Notably, 42 technical and entrepreneurship trainings have been launched across the region, delivering critical

skills to 1270 beneficiaries, and 27 SMEs have also been supported with tools to improve product quality and streamline production efficiency. In addition, over 3300 women have benefited from newly established bamboo charcoal briquette-making units.

The project has also had a notable environmental impact. It has supported 36 large-scale and over 100 small-scale nurseries that have produced 3.65 million plants. In addition, three site-species matching studies have been completed; 600 hectares of new bamboo plantation as well as 1600 hectares of forest and farmland are now benefiting from a sustainable management regime; and over 5500 smallholders are receiving technical assistance, planting material and support for sustainable management.

Project work has significantly upgraded the business and trade environments of the participating countries. Nine cooperatives or associations supporting 1037 farmers have been registered, while 18 national product standards have been developed. Nearly 5700 participants have received awareness training across 11 organized events. Three bamboo

▲  
*Capacity building on bamboo propagation, planting and establishment took place in Uganda.*



▲ *Entrepreneurial skills training on bamboo weaving and product design convened in Ghana.*

units within government line ministries have been established, and one investor study tour has been organized. Three national-level bamboo associations are now being strengthened and supported to help design long-term strategic plans for sustainable bamboo resource development.

### Using climate-smart value chains to improve lives in Africa

The Intra-African Bamboo Smallholder Farmer Livelihood Development Programme funded by IFAD continued to progress in scaling up bamboo resources, facilitating bamboo as a tool for environmental protection, integrating bamboo into national strategies and enabling the transfer of knowledge and skills within Africa and from China. African smallholder farmers as well as women and youth in Cameroon, Ghana, Ethiopia and Madagascar were the primary beneficiaries of the project, which ended in 2022.

During 2022, 209 participatory stewards were trained to support project activities and ensure sustainability, while other trainings on skills and enterprise

development reached nearly 1000 beneficiaries. Furthermore, over 3000 smallholder farmers received training on bamboo agroforestry systems, sustainable harvesting and management, and on silvopastoral development. Nurseries benefited from robust support, leading to the production of over 200,000 bamboo seedlings, and over 1135 beneficiaries received training on bamboo nursery and planting material production.

Two journal publications on bamboo allometric and environmental metrics were published, helping clarify and fill in gaps in the regional data, while bamboo policy round-tables were organized in each of the participating countries, generating multi-stakeholder support for fostering an enabling policy environment for business growth. These impacts will produce lasting benefits that will outlive the program's duration.

### Helping facilitate projects in Africa

The South-South and Triangular Cooperation project aimed to support the implementation of the Intra-Africa Bamboo Smallholder Farmer Livelihood Development Programme with the



overall goal to improve bamboo and rattan value chain conditions through increased awareness, an improved policy framework, investment promotion and enhanced connectivity between technical experts from beneficiaries' countries for knowledge transfer and high-quality standards. These goals were achieved by transferring solutions, knowledge, skills and technologies both within Africa and from China to target countries in Africa.

The project targeted stakeholders from Cameroon, Ethiopia, Ghana and Madagascar as well as other INBAR Member States in Africa to replicate and scale up bamboo's potential for livelihood development and environmental management across the greater African continent. During 2022, key accomplishments included the organization of one regional symposium with 46 participants from 22 countries, aimed at investment promotion, cross learning and partnership development.

Another key accomplishment included the development of five voluntary standards: 1) Bamboo charcoal kiln design and construction; 2) improved cook stove design and construction; 3) bamboo bio-energy commoditization;

4) bamboo for forest landscape restoration; and 5) criteria for certification of natural and established plantation.

A number of new innovative products were also developed and piloted during the project timeframe such as bamboo charcoal, bamboo pellets, bamboo briquettes, bamboo bicycles and tricycles, bamboo basketry and bamboo toothpicks. The project was also funded by IFAD, and the grant ended June 2022.

### Bambuzonía: Improving the Amazon's resilience with bamboo

Since 2019, INBAR has been implementing the Bambuzonía project across the Amazonian region of Colombia, Ecuador and Peru, with funding from IFAD. The project harnesses the potential of bamboo to address land degradation, deforestation and climate change, while bolstering livelihoods in rural communities. Specific objectives include improving governance at all levels, promoting climate-smart practices, supporting livelihood diversification and income generation, and increasing awareness of the benefits of bamboo.

▲  
*INBAR projects have facilitated the construction of bamboo buildings across Latin America such as the Tzancuvatziri hill lookout in Peru.*

Great progress was seen as project work unfolded in 2022. On the governance front, a bamboo development plan for the Amazonia provinces was announced in Ecuador. Peru formalized its National Bamboo Development Strategy (2022–2025), and Colombia passed a National Law (No. 2206) to encourage the productive use of bamboo. These efforts have mainstreamed bamboo resources into the development agendas of participating countries and raised awareness about the positive impacts of the plant.

Zooming in, over 3000 smallholders have implemented bamboo farming systems and sustainable management practices. The project has supported the establishment of 22 nurseries which have produced over 100,000 plants while also facilitating the planting of bamboo across 114 kilometers of farm boundaries or shelter belts and establishing/managing 288 hectares of bamboo plantation land. To support the livelihood diversification of these producers and users, three bamboo market study reports have been prepared for each country. Approximately 900 men, youth and women have benefited from capacity building on bamboo value chains and enterprises management.

Localized knowledge products have been published, including a bamboo species identification guide, construction techniques, harvesting and treatment guides, ecosystem services, using bamboo for basic construction, allometric and environmental research methodology as well as videos on bamboo management. Major regional events emerging from the project include an international seminar for bamboo policy and industry with 103 attendees, a regional study tour in Colombia for co-beneficiaries in Ecuador and Peru, and SIBGUADUA with 261 participants from 13 countries, all of

which have contributed greatly to raising the profile of bamboo in the Amazon.

### **Promoting bamboo as a high-quality construction material**

Funded by AECID, this project advocated for bamboo as a nature-based solution to Ecuador's housing crisis. Despite coming to a close in 2022, the project led to the development of bamboo housing prototypes that facilitate the national policy of using sustainable construction to build at least 400 bamboo houses as part of the SDG Cities program. In addition, the involvement of locally trained graduates from the bamboo workshop school during the construction process as well as obtaining bamboo poles from local producers contributes to boosting local employment and strengthens climate change mitigation with the use of the low-carbon material.

The country is now getting behind bamboo in a big way. Ecuador's President Guillermo Lasso and Gabriela Aguilera, Minister of the Ministry of Urban Development and Housing, participated in the launching ceremony for sustainable bamboo housing in Manabí. Other noteworthy policy developments include the proclamation of nine municipal-level policy instruments for bamboo promotion, bamboo listed as a sustainable material under the National Housing Policy, and new participatory certification models for the sustainable management of operationalized bamboo forests and farms.

The Manabí Workshop School has empowered 74 students with bamboo construction skills and knowledge. These students are now well poised to accelerate the development of the sustainable bamboo management sector, particularly given the high level of support from

Ecuador's Government, and continue to carry out sustainable bamboo production, management and construction to address the housing shortage.

### Planning a greener decade in Cameroon

INBAR is a key partner of The Restoration Initiative, an international project funded by the Global Environment Facility, which targets the reversal of degradation and landscape restoration around the world.

In Cameroon, INBAR works under the project umbrella to achieve the following objectives: Improve the engagement of Cameroon's Government with forest land restoration and sustainable land management; evaluate the potential of bamboo/non-timber forest products for biodiversity conservation, green livelihoods and carbon storage; strengthen institutional capacity and finance mechanisms for large-scale restoration; and disseminate best practices.

In 2022, a major breakthrough was achieved. With support from the project, Cameroon's Forest and Landscape Restoration Harmonized Action Plan 2020–2030 was finalized and adopted by the Government of Cameroon. The plan is critical to securing the green future of Cameroon, as it synergizes actions across different strategic orientations, functioning as a clear roadmap for intervention approaches on ecosystem restoration. Other notable outputs included publication of the Restoration Opportunities Assessment Methodology and a manual for the integration of bamboo in agroforestry systems.

Forest and landscape restoration work carried on with great success. With nearly 300,000 new seedlings raised, 510

hectares of land restored, 4500 hectares of degraded forest land brought under a sustainable management regime, 1600 local people trained on plantation, value chain development with material and financial support, as well as other capacity building interventions, the work has left an indelible mark on the restoration efforts of Cameroon. Local forest committees have been established in each of the project landscapes, which fosters multistakeholder involvement for forest landscape restoration efforts. These committees are in charge of coordinating activities across specific landscapes.

### Placing bamboo at the forefront of innovation in Ecuador

In 2022, INBAR made major strides in advocating for bamboo education in Ecuador.

With funding from AECID, the International Network of Universities and Research Centers related to bamboo (RIUCI bambú) was established, uniting 35 academic institutions from 11 countries. Knowledge generation, knowledge management and knowledge upgradation are the key work areas of the network. At the same time, nine innovative bamboo projects were selected out of 34 applications for intensive mentoring, and three sustainable construction start-ups have also been provided financial support.

Bamboo is special in Ecuador for several reasons. The country is home to rich natural bamboo resources, but they are often overlooked in academic contexts. Particularly now in the era of climate change, when global attention is moving to the development and utilization of sustainable, renewable materials with low environmental impacts in the construction sector, the project plays



▲  
*International demand is growing for bamboo products made in Viet Nam. Credit: RECOFTC.*

an important role linking research and innovation with sustainable societal as well as market development.

### **Bouncing back with bamboo**

In Ecuador, Manabí has greatly benefited from INBAR's bamboo construction interventions. This project, also supported by AECID, is designed to help local people in Manabí bounce back from COVID-19 through identifying and developing new sustainable ways forward. Bamboo is now offering local communities numerous sustainable development opportunities alongside economic revitalization for the vulnerable population.

This project provides technical support for the construction of the first social bamboo house prototype for Ecuador's Government. Another social housing prototype was completed to further address the country's bio-climatic and cultural contexts. Additionally, a chapel was built using bamboo materials in Cojimies, while Alhajuela saw the construction of bamboo bus stops and bamboo-reinforced classroom structures, helping to promote the alternative material as a driver of the green economy.

Due to increasing interest and demand for bamboo construction, INBAR began to expand its project work to other areas of Manabí in 2022. Last year, an agreement was made with Calderon to develop an operational plan for establishing another bamboo workshop school, and the registration process for it is now underway. These efforts will help spread bamboo construction-related skills across the country to scale up utilization of the alternative forest resource.

### **Recovering traditional knowledge with bamboo in the Amazonia**

With the support of FAO, a bio-centric restoration project in the Amazonian region of Ecuador has been working to boost conservation efforts in Indigenous Peoples' territories. These natural environments are under increasing internal and external pressures from a variety of sources, like deforestation and agricultural encroachment. The initiative seeks to increase the resilience of Indigenous Peoples to climate change through bio-centric conservation and restoration of forest and water ecosystems in the region.



Over 100 members from four communities in Napo participated in the development of community restoration plans. Four bamboo community nurseries have been established, leading to the production of approximately 13,000 plants. Ten hectares of land have also been restored with bamboo and other species.

Several workshops on issues related to biodiversity, natural resources, food systems and traditional knowledge have been organized in the communities, strengthening intergenerational knowledge exchange. A manual for restoration was prepared in collaboration with local communities.

### Refining landscape restoration policy in Southeast Asia

Ending in 2022, the FLOURISH program, financially supported by Germany's Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and Consumer Protection via the International Climate Initiative, was aimed at enhancing the potential of forests for climate change mitigation and adaptation as well as livelihood development. The program accomplished this

through production-driven landscape restoration and community-private sector partnerships, leading to triple-win outcomes consisting of forest restoration, forest productivity and improved livelihoods in Lao PDR, Thailand and Viet Nam.

In 2022, one of the major outputs from the program was the policy brief titled Private Sector-Community Partnerships in the Lung Bamboo Value Chain are a Model for Restoring Forests and Improving Livelihoods in Viet Nam, which details the ways in which smart government interventions alongside production-driven partnerships between forest communities and the private sector can improve livelihoods and economic development while rejuvenating forest landscapes.

In addition, INBAR and RECOFTC jointly organized a side event at XV WFC, and experiences from the FLOURISH project as well as a promotional video showcasing how lung bamboo can bolster resilience for Indigenous Peoples and local communities residing near forests were shared with the international audience.

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A design and product development workshop helped empower local communities in India with new skills to bolster household resilience.

### Wielding bamboo to drive India's pandemic recovery

With support from GiZ, a small project was implemented in India from 2021 to 2022. The project aimed to harness the untapped potential of bamboo for accelerating India's recovery to the unprecedented lockdowns and market disruptions related to the COVID-19 pandemic, which led to a high degree of economic turmoil, particularly in the informal job sector. The project sought to assess economic opportunities, environmental relevance and devise appropriate action strategies using India's native bamboo resources, which are substantial.

Two major accomplishments occurred in 2022. First, a study was conducted to evaluate existing and potential markets for bamboo products across sectors like lifestyle, utilities and housing and construction materials. Second, 10 innovative product designs were created with prototypes, and two training programs were conducted for 50 artisans and entrepreneurs in two different locations. Moreover, 10 business incubation/start-up mentoring sessions were organized for young entrepreneurs willing undertake bamboo-related enterprises. Over 1000 artisans and entrepreneurs have ultimately benefited through this intervention.

### Bolstering sustainable livelihoods and green development in Chishui

Unique red geologic formations known as "danxia" can be found scattered across the landscape of southeastern China. The Chishui Danxia World Heritage Site, found in Guizhou, China is also home to rich bamboo resources. For local communities, bamboo has been a part of their sustenance and livelihoods for thousands of years. Partnering with

the UN Educational, Scientific, and Cultural Organization (UNESCO) and the Chishui Forestry Bureau and with financial support from the Mercedes-Benz Star Fund, INBAR is now implementing a project in the bamboo-rich part of China. The project is aimed at strengthening culture-oriented, innovative, inclusive, socio-economic and low-carbon development.

2022 featured numerous important updates for the Chishui project. Two training workshops for 25 trainees on bamboo weaving were organized, spanning 15–30 days and targeting women and disadvantaged groups. Importantly, the project established a long-term bamboo-related craftsmanship training center at the Jizhutang Intangible Heritage Bamboo Weaving Center in Datong, which will act as an incubator for cultivating bamboo-related artisans and young talents. The training center will also strive to transfer knowledge and techniques to locals. In addition, eight short video training modules on bamboo materials preparation, tools, weaving techniques, popular patterns and product production have been created to support local capacity building. Products produced by beneficiaries of the Chishui project were showcased at UNESCO's booth at the major trade fair in Beijing, CIFTIS 2022. Finally, INBAR and UNESCO jointly organized a parallel session at BARC 2022 that highlighted the role of bamboo in reducing carbon emissions and combating climate change at World Heritage Sites.

### Enhancing biodiversity and benefits with trade

The "Trade Hub" project, led by the UNEP World Conservation Monitoring Centre (UNEP-WCMC) and funded by the Global Challenges Research Fund, aims

to make trade a positive force for people and nature conservation. Part of this process, INBAR produces regular installments of trade reports on bamboo and rattan, both international and domestic in scope, to fulfill the requirements of the project.

During 2022, a report on the potential of bamboo for plastic substitution was drafted, featuring information and knowledge on the trade, production, market demand and challenges of bamboo products that can replace plastics and other environmentally harmful materials. This will particularly support the Bamboo as a Substitute for Plastic Initiative jointly launched by the Government of China and INBAR. In addition, a synthesis report that analyzed the impact of bamboo forests, products and trade on biodiversity in China was published. INBAR's work under Trade Hub has recently focused on building internal and external capacities around the topic of plastic substitution. A Parallel Session on Replacing Plastics with Bamboo: Policy, Roadmap and Actions was jointly organized by INBAR and UNEP-WCMC at BARC 2022. This session deliberated on the pathways and mechanisms to mainstream bamboo products as viable alternatives to plastics.

### Revealing bamboo's capacity with updated measurements

Led by the World Meteorological Organization and funded by the Quadrature Climate Foundation, the four-year bamboo carbon measurement project officially kicked off in March 2022. The objective of this project is to develop a methodology to measure the carbon sequestration potential of bamboo forest under different land management and environmental conditions.

To assess the carbon sink potential of bamboo forests, this project compares the traditional bottom-up emissions inventory estimation with an innovative observations-based methodology through accurate atmospheric measurements combined with inverse modeling to reduce uncertainty in the emissions and potential biases. During the preliminary start-up period, INBAR together with project partners and the local forestry bureau finalized the bamboo forest site for installing observation towers in Anji, Zhejiang. The INBAR team has also conducted a survey of bamboo management practices and a traditional bottom-up inventory to assess baseline biomass and carbon stock in the bamboo forest, which will be used to measure carbon fluxes mainly caused by carbon sequestration and biomass extraction from bamboo forests throughout the project's timeframe.

### Leveraging forest management

Funded by the World Wide Fund (WWF) Beijing office, the objective of this project is to analyze the impact of the large-scale intensive bamboo forest management model and its contributions to sustainable bamboo forest and economic development by analyzing case studies from Zhejiang, China.

Four case studies on typical models that enable sustainable bamboo forest management have been collected and analyzed. A synthesis report has been produced that uses lessons learned to understand the feasibility of bamboo forest management and land transfer schemes. Results from this project were shared at the parallel session on Key Challenges and Solutions of Sustainable Bamboo Forest Management jointly organized by INBAR and the WWF Beijing office at BARC 2022.

# KNOWLEDGE SHARING AND LEARNING

*INBAR shared knowledge and coordinated training programs to raise awareness and build capacity among its Member States.*



## Cultivating new global followers of bamboo and rattan

INBAR's e-learning program focused on the themes of circular economy and regional cooperation in 2022. To address these, the program organized 17 specialized, featured and regionalized webinars as well as five training courses to facilitate national and regional green growth utilizing bamboo and rattan sectoral development.

In 2022, INBAR e-learning program reached over 4000 participants from 100 countries and regions around the world through its webinars and training programs. INBAR's YouTube channel surpassed 127,000 views, with viewership coming from fields like agriculture and forestry, science and education, construction and engineering, commerce and trade, community and development agencies, and governments. Topics with higher participation and viewership were related to down-stream product development technology and the circular economy. Given the good reception of INBAR's e-learning and training program, it will extend throughout 2023.

## Delivering results with government

In 2022, INBAR continued its close partnership with ICBR to organize online training programs sponsored by China's Ministry of Commerce for 321 participants from 17 INBAR Member States. Due to COVID-19 pandemic restrictions, all trainings were conducted online, elucidating a wide variety of knowledge and techniques for trainees related to the bamboo and rattan sectors.

Furthermore, three bilateral training seminars were organized by INBAR and ICBR for Cambodia, Ecuador and Myanmar. These trainings were focused

on handicrafts and furniture processing, which require significant hands-on practice and in-person exercises, presenting a challenge for an online course. Detailed video materials were prepared well in advance, with specific steps for each process and extensive prior discussion with counterpart institutions to ensure that necessary materials and tools would be readily available. Ultimately, the trainings were resounding successes, and participants expressed appreciation for the robust support.

## Branching out bamboo development

In 2022 INBAR sponsored and implemented two bilateral training workshops on sustainable bamboo development in Lao PDR and Guyana.

The training workshop for Lao PDR was organized in collaboration with the National Agriculture and Forestry Research Institute of Lao PDR. The purpose was to raise awareness and build capacities for the conservation, sustainable management and utilization of bamboo resources, promote bamboo's roles in ecological services, rural livelihood development and economic development, and strengthen cooperation between INBAR, China and Lao PDR in fields related to bamboo resource development.

A total of 66 government officials and researchers attended the training. Experts, researchers and entrepreneurs from China gave presentations on bamboo propagation and nursery management as well as bamboo products such as bamboo shoots, bamboo woven handicrafts, bamboo sticks and panels and bamboo biomass utilization, while also conducting in-depth Q&A with trainees.



▲ Participants of the collaborative training in Guyana show off their finished products with China's Ambassador to Guyana, Guo Haiyan.

The training workshop for Guyana was organized in collaboration with the Chinese Embassy in Guyana and the Government of Guyana. The workshop featured three days of lectures from Chinese master artisans, followed by 10-day on-site instruction by Ecuadorian craftsmen in Guyana. The workshop helped raise awareness among bamboo stakeholders in Guyana on bamboo's roles in ecological conservation as well as social and economic development for rural revitalization and landscape restoration.

In total, 60 participants attended the training online, while 30 participants joined both online and offline. At the end of the training, participants learned basic bamboo basket-weaving techniques, and an exhibition of their final woven bamboo products was presented at the closing ceremony.

### Virtual stakeholders tap into promising bamboo sectors

INBAR is working with CEMCA in undertaking two training and capacity building projects: One on furniture-making in Bangladesh and Sri Lanka, and another

on bamboo-engineered products in Brunei, India and Malaysia.

For the first project, AV modules comprising 13 topics were created in English on bamboo furniture-making and translated into both Sinhala and Bengali, totaling 11 hours of learning content. For the second project, AV modules comprising 6 modules totaling 5 hours were produced on manufacturing processes of laminated composites and scrimber board, which were prepared in English, Mandarin and Malay. A three-day training program on bamboo scrimber, laminated composites and value-added products saw strong participation, with over 300 attendees coming from over 40 countries. Though both projects officially ended in 2022, follow-up activities are expected with renewed partner engagement.

### New standards paving the way for vital green development

Standards are an important way to help ensure competitiveness across borders and establish products as safe, reliable and high-quality in the minds of consumers and suppliers, making them invaluable to cross-border trade.



In 2022, the International Organization for Standardization (ISO) published a new standard for grading rattan, helping to facilitate its entry into markets. ISO 23067:2022 addresses inconsistencies between producers and exporters of rattan raw materials and products across INBAR Member States, functioning as a unified, agreed-upon standard for the methods and systems of grading and classifying rattan and related products. This standard aims to improve the international trade of rattan products among stakeholders by providing an assurance of the quality of raw materials or products. The standard was developed by Technical Committee 296-Bamboo and Rattan, Working Group 4-Rattan (ISO/TC 296 WG4). INBAR is active in this Technical Committee, with previous standards focusing on bamboo flooring for indoor use and standard terminology for rattan materials and products.

INBAR also plays an active role in supporting its Member States develop national standards. In the case of Cameroon, with the support of the China-IFAD South-South Triangular Cooperation (SSTC), INBAR has supported the development of nine national standards in Cameroon in a wide variety

of areas, from structural applications of bamboo, culm design, construction, testing methods for determining physical and mechanical properties, terms related to bamboo and rattan products, bamboo charcoal, bamboo flooring and grading of bamboo culms. Ethiopia has also benefited from INBAR's policy inputs in the development of four national standards related to bamboo charcoal and bamboo curtains.

INBAR Task Forces are also home to a high level of productivity, with support from China-IFAD SSTC funding. They produce Voluntary Guideline Standards (VGSs), which are useful consensus-building reference documents for the later development of national and international standards. The Task Force on Bamboo for Renewable Energy has developed three VGSs on bamboo charcoal kiln design and construction, bamboo commoditization, and improved cook stove design and construction. The Task Force on Sustainable Bamboo Management has also developed two VGSs on a step-by-step guide on the use of bamboo for forest-landscape restoration, and criteria for certification of natural and established plantations.

▲  
*Standards help pave the way for structures such as the hill lookout built as part of the Bambuzonia project.*

## Publications

All publications listed below are in English unless stated otherwise. A full list of INBAR publications can be found on the online Resources Center: [www.inbar.int/resources/](http://www.inbar.int/resources/).

### Annual Highlights

*INBAR Annual Highlights 2021* (Chinese, English, French and Spanish)

### Bamboo and Rattan Update

Volume 3 Issue 1 (March) *Africa: Reflections on 25 Years* (English, French, Spanish, Chinese)

Volume 3 Issue 2 (June) *Asia and the Pacific: Reflections on 25 Years* (English, French, Spanish, Chinese)

Volume 3 Issue 3 (September) *Latin America and the Caribbean: Reflections on 25 Years* (English, French, Spanish, Chinese)

Volume 3 Issue 4 (December) *BARC in Beijing: Reflections on 25 Years* (English, French, Spanish Chinese)

### Second Global Bamboo and Rattan Congress 2022

*INBAR 25<sup>th</sup> Anniversary Album* (English, Chinese)

*BARC 2022 Handbook* (English, Chinese)

*BARC 2022 Abstracts* (English, Chinese)

*Bamboo as a Substitute for Plastic Initiative* (English, Chinese)

### Books

*Contemporary Bamboo Architecture in China*

*2019 International Bamboo Construction Competition: From the Concepts to the Realized*

### General Information

*Report of the Africa Bamboo and Rattan Congress 2022*

*Bamboo as a Green Business Opportunity in Ethiopia*

*Support Bamboo Industry and SME Value Chains in Uganda: Selected cases*

*Manual de construcción de estructuras livianas con bambú en el Perú* (Spanish only)

### Technical Reports

*INBAR Technical Report #44: Global Priority Species of Economically Important Bamboo*

### Trade Reports

*Trade Overview 2019: Bamboo and Rattan Commodities in the International Market* (English, Chinese)

*Trade Overview 2020: Bamboo and Rattan Commodities in the International Market* (English, Chinese)

*Trade Overview 2020: Bamboo and Rattan Commodities in China* (English, Chinese)

*Trade Overview 2021: Bamboo and Rattan Commodities in China* (English, Chinese)

## Policy Briefs

*Developing the Rattan Sector in Africa*

## National Bamboo Strategies

*Kenya Bamboo National Policy 2022*

*Estrategia Nacional para el Desarrollo del Bambú de Perú (PROBAMBÚ) 2022 – 2025* (Spanish)

## Working Papers

*Ecosystem Services from Bamboo Forests: Key Findings, Lessons Learnt and Call for Actions from Global Synthesis*

*Guidelines on Sustainable Bamboo Energy Production and Investment in Africa*

*Synthesis Review of Bamboo Bioenergy Production in Africa*

*Manuel sur l'intégration du bambou dans l'agroforesterie au Cameroun* (French only)

*Gender Analysis of the Bamboo Sector in Ethiopia, Kenya and Uganda*

*The Role of Rattan in the Socioeconomic Development of Indonesia*

*Bamboo Site-Species Matching Study in Uganda*

*Bamboo Site-Species Matching Study in Kenya*

*Bamboo Fodder Production and Utilisation Practices in Ethiopia*

*Experimentation and Trials on Bamboo Leaves as Fodder for Animals in Ethiopia*

*Post-Harvest Bamboo Treatment, Preservation and Storage Practices*

*The Impacts of Bamboo Forests, Products and Trade on Biodiversity in China: A Synthesis Report Based on Literature Review*

## Academic articles published by INBAR staff

Anjulo, A., Mulatu, Y., Kidane, B., Reza, S., Getahun, A., Mulat, S., Abere, M., and Teshome, U. (2022). "Oxytenanthera abyssinica A. Rich. Munro species-site suitability matching in Ethiopia." *Advances in Bamboo Science* [online]. Accessed 15 March 2023, <https://doi.org/10.1016/j.bamboo.2022.100001>.

Cadena, D., Jacome, P., and Córdova, P. (2022). "Determinación de las propiedades geométricas y mecánicas de compresión y tracción de la especie *Phyllostachys aurea* del Ecuador." *Revista Campus de la Facultad de Ingeniería y Arquitectura de la Universidad de San Martín de Porres*.

Dauletbek, A., Xue, X., Shen, X., Li, H., Feng Z., Lorenzo, R., Liu, K., Escamilla E., Yao, L., Zheng, X. (2022). "Lightweight bamboo structures — Report on 2021 International Collaboration on Bamboo Construction." *Journal of Sustainable Structures* [online]. Accessed 15 March 2023, <https://doi.org/10.54113/j.sust.2023.000025>.

- Kaushal, R., Islam, S., Tewari, S., Tomar, J.M.S., Thapliyal, S., Madhu, M., Trinh, T. L., Singh, T., Singh, A., and Durai, J. (2022). "An allometric model-based approach for estimating biomass in seven Indian bamboo species in western Himalayan foothills, India." *Scientific Report*. Accessed 15 March 2023, <https://doi.org/10.1038/s41598-022-11394-3>.
- Kaushal, R., Roy, T., Thapliyal, S., Mandal, D., Singh, D.V., Tomar, J.M.S., Mehta, H., Ojasvi, P.R., Lepcha, S.T.S, and Durai, J. (2022). "Distribution of soil carbon fractions under different bamboo species in northwest Himalayan foothills, India." *Environmental Monitoring and Assessment* [online]. Accessed 15 March 2023, <https://doi.org/10.1007/s10661-022-09839-3>.
- Kwaku, M. (2022). "Nutritional evaluation of the leaves of *Oxytenanthera abyssinica*, *Bambusa balcooa*, *Moringa oleifera*, *Terminalia catappa*, *Blighia sapida*, and *Mangifera indica* as non-conventional green roughages for ruminants." *Journal of Agriculture and Food Research*.
- Liu, K., Demartino, C., Li, Z., Liu, Q. H., and Yan, X. (2022). "Conclusion and Future Perspective." In: Liu, K., Dermartino, C., Li, Z., Liu, Q. H., and Xiao Y. (Editors): *2019 International Bamboo Construction Competition: From the Concepts to the Realized Pavilions*. Springer, 245-269. Accessed 15 March 2023, <https://link.springer.com/book/10.1007/978-3-030-91990-0>.
- Liu, K., Demartino, C., Li, Z., Liu, Q. H., and Yan X. (2022). "The 2019 International Bamboo Construction Competition." In: Liu K. W., Dermartino C., Li Z., Liu Q. H., & Xiao Y. (Editors): *2019 International Bamboo Construction Competition: From the Concepts to the Realized Pavilions*. Springer, 1-13. Accessed 15 March 2023, <https://link.springer.com/book/10.1007/978-3-030-91990-0>.
- Liu, K., Durai, J., Jacome, P., Shi, Y., Jun, Y., Wu, J., Luis, F.L., Borja, E., and Moreno, F. (2022). "Create an enabling environment for bamboo construction sector in Africa, Asia, and Latin America." *NOCMAT* [online]. Accessed 15 March 2023, <https://doi.org/10.5281/zenodo.6583988>.
- Liu, K., Durai, J., Shib, Y., Harries, K., Yang, J., Wei, J., Shi, Y., Wu, J., Jacome, P., and Trujillo, D. (2022). "Bamboo: A Very Sustainable Construction Material — 2021 International Online Seminar summary report." *Sustainable Structures* [online]. Accessed 15 March 2023, <https://doi.org/10.54113/j.sust.2022.000015>.
- Liu, K., Wang, X. L., and Zhang, Y. J. (2022). "Research on Human Resource Management of International Organizations: A Case Study of the International Bamboo and Rattan Organization (INBAR)." *Chinese Talents*. (in Chinese).
- Oriwo, V., Wairago, N., Oduor, N., and Durai, J. "Nutrient Content of Bamboo Shoots from Selected Bamboo Species in Kenya." *American Journal of Agriculture and Forestry* [online]. Accessed 15 March 2023, <https://doi.org/10.11648/j.ajaf.20221001.13>.
- Patra, S., Kaushal, R., Singh, D., Kumar, R., Gadedjisso-Tossou, A., and Durai, J. "Surface soil hydraulic conductivity and macro-pore characteristics as affected by four bamboo species in North-Western Himalaya, India." *Ecohydrology & Hydrobiology* [online]. Accessed 15 March 2023, <https://doi.org/10.1016/j.ecohyd.2021.08.012>.
- Reza, S. and Oduor, N. (2022). "Responding to local demand: A community-led bamboo charcoal enterprise development initiative in Kenya." *Journal of Non-Timber Forest Products* [online]. Accessed 15 March 2023, <https://doi.org/10.54207/bsmps2000-2022-XUJ4W9>.

Sasu, P., and Kwaku, P. (2022). "Bamboo Leaves: Hope for Dry Season Ruminant Livestock Production in Ghana." *International Journal of Innovative Science and Research Technology* [online]. Accessed 15 March 2023, <https://doi.org/10.5281/zenodo.6760039>.

Wang, X., Wu, J., Liu, K., and Fu, J. (2022). "Nature-Based Solutions: The Realization Path of Bamboo Assisting Carbon Neutrality." *Natural Protected Areas* [online]. (in Chinese). Accessed 15 March 2023, <https://doi.org/10.12335/2096-8981.2022022802>.

Zhang, J., Qian, X., Yang, N., Yang, Q., Liu, K., and Nie, S. (2022). "Dynamic Test and Finite Element Model Modification of Long-Span Round Bamboo Arch Structure." *Journal of Building Structures* [online]. (in Chinese). Accessed 15 March 2023, <https://doi.org/10.14006/j.jzjgxb.2020.0774>.

## Meetings

### **World Forestry Congress**, 2 to 6 May, Seoul, Korea

INBAR hosted two side events: 1) Delivering Multiple Benefits for People and the Earth Through Bamboo and 2) Bamboo as a Sustainable Biomass Energy for Africa.

### **Africa Bamboo and Rattan Congress**, 20 to 22 April, Yaoundé, Cameroon

INBAR hosted the first regional Bamboo and Rattan Congress to help make bamboo and rattan the engine of a resilient and sustainable green economy in Africa.

### **17<sup>th</sup> Session of the UN Forum on Forests**, 9 to 13 May, New York, USA

INBAR hosted the side event Bamboo as an Effective Tool for Ecosystem Restoration.

### **The 30<sup>th</sup> European Biomass Conference and Exhibition**, 9 to 12 May, online

The Chair of INBAR's Renewable Energy Task Force spoke on bamboo for renewable energy.

### **15<sup>th</sup> Session of the Conference of the Parties to the UN Convention to Combat Desertification**, 9 to 20 May, Abidjan, Côte D'Ivoire and online

INBAR hosted the session Bamboo for Ecosystems Restoration and Green Growth.

### **International Conference on Non-Conventional Materials and Technologies**, 7 to 23 June, online

### **International Bamboo and Guadua Symposium**, 15 to 17 September, Lima, Peru

The event for the bamboo sector in Latin America featured international speakers and promoted the use, research, development and technological innovation, and dissemination of knowledge.

### **27<sup>th</sup> Session of the Conference of the Parties to the UN Framework Convention on Climate Change**, 6 to 18 November, Sharm El-Sheikh, Egypt

INBAR hosted two side events: 1) The Potential of Bamboo as a Material for Sustainable Construction and Circular Economic Development and 2) Bamboo as a Substitute for Plastics Initiative

### **Celebration of INBAR's 25<sup>th</sup> Anniversary and the Second Global Bamboo and Rattan Congress**, 7 to 8 November, Beijing, China and online

**World Trade Organization-UN Conference on Trade and Development Workshop on Sustainable and Effective Substitutes and Alternatives for Plastics, 17 November to 6 December, Geneva, Switzerland and online**

INBAR took part in the dialogue and workshops on plastics pollution and environmentally sustainable plastics trade.

**First session of the Intergovernmental Negotiating Committee to develop an international legally binding instrument on plastic pollution, 28 November to 2 December, Punta Del Este, Uruguay**

INBAR introduced the Bamboo as a Substitute for Plastic Initiative and submitted a written statement.

**High Ambition Coalition to End Plastic Pollution: Road map to end plastic pollution by 2040, 8 December, Kigali, Rwanda**

This event provided an opportunity to discuss and define the vision and roadmap to End Plastic Pollution by 2040.

**2022 International Conference – Bamboo: A Very Sustainable Construction Material & the 3<sup>rd</sup> World Symposium on Sustainable Bio-Composite Materials and Structures, 8 November to 13 December, Beijing and virtual**

15<sup>th</sup> Session of the Conference of the Parties to the UN Convention on Biological Diversity, 7 to 19 December, Montreal, Canada

INBAR had a booth at the conference and took part in the side event on Bamboo Forest Biodiversity, Ecological-Economic Complex, and Carbon Sink.

## Trainings

**Webinar: Bamboo Industry Development in West Africa Promotes Green Circular Economy, 3 March**

**Online Course: Sustainable Management of Bamboo Resources in Latin America and the Caribbean, 13 to 15 April**

**Online Training Workshop: Sustainable Bamboo Development in Lao PDR, 10 to 13 May**

**Online Training on Engineered Bamboo for Sustainable Construction Conference, 17 to 19 May**

**Online Training on Bamboo Scrimber, Laminated Composites and Value-added Products, 25 to 27 May**

INBAR, in collaboration with the Commonwealth Educational Media Centre for Asia, built capacity on the ways in which round raw bamboo culms are processed into hardwood-like substitutes.

**Training Bamboo Entrepreneurs on Business Development Services, 2 August, Nairobi, Kenya**

**Bamboo Standards Development and Certification Mechanisms, 1 to 5 August, Thika, Kenya**

**Training Workshop on Sustainable Bamboo Development in Guyana, 15 to 29 August, Guyana and online**

**Cross-Learning Study Tour in Ethiopia**, 4 to 7 September, Ethiopia

The study tour took bamboo practitioners from Kenya and Uganda to model nursery sites, plantations, enterprises and bamboo industries in Ethiopia.

**Webinar: Development and Challenges of the Global Bamboo Construction Sector**, 8 September**Regional standards and certifications training in Kenya**, 18 to 19 October, Nairobi, Kenya**Bamboo Value Chains for Inclusive and Sustainable Industrialization in Africa**, 21 November, online

INBAR participated in the UN Industrial Development Organization side event as part of the African Union Summit on Industrialization and Economic Diversification.

**Sustainable Materiality for Vernacular Construction Workshop**, 1 to 22 November, Kumasi, Ghana

INBAR joined the Kwame Nkrumah University of Science and Technology to host this workshop in Ghana.

**Training Workshop on Bamboo Sustainable Construction**, 19 to 27 November, Venezuela.**Regional Bamboo Forest Management and Chain of Custody Training**, 12 to 16 December 2022, Ethiopia

INBAR hosted two training in collaboration with Soil Association Certification Limited UK.

## Activities

**INBAR International Photo Competition 2022**, 21 March to 18 September

The third consecutive year of INBAR's annual photo competition showcased the uses of bamboo and rattan for sustainable development.

**2022 Lancang-Mekong Cooperation Design Award**, 1 July to 31 October 2022

Themed "Weaving the Future," the competition called for poster designs and bamboo and rattan woven pieces to celebrate exchange between Lancang-Mekong countries.

**2022 China International Fair for Trade in Services**, 31 August to 5 September, Beijing, China

INBAR designed and ran a booth at the fair to promote bamboo as a biobased, low-carbon alternative to plastic products.

**Bamboo Business Roundtable**, 14 September, Peru

This event provided a space for entrepreneurs to sell products and connect with buyers.

**World Bamboo Day**, 18 September**Bamboo Days**, 7 to 9 October, Valencia, Spain

This event focused on bamboo and its uses in the Iberian Peninsula.

**2022 International Bamboo Industry Brand Expo and the 3<sup>rd</sup> China (Yibin)**

International Bamboo Industry Development Summit, 10 to 11 November, Yibin, China

**2022 International Yong'an Bamboo Expo**, 8 December, Yong'an, China**2022 International Bamboo Industry Fair in China**, 8 to 12 December, Meishan, China

